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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/991,703	11/26/2001	Claes Ohngren	024444-990	3922

7590 08/05/2004

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EXAMINER	
KERNS, KEVIN P	

ART UNIT	PAPER NUMBER
1725	

DATE MAILED: 08/05/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/991,703	OHNGREN ET AL.	
	Examiner	Art Unit	
	Kevin P. Kerns	1725	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *20 July 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-3 and 5-10* is/are pending in the application.

4a) Of the above claim(s) *8 and 9* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-3,5-7 and 10* is/are rejected.

7)☒ Claim(s) *10* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *20 July 2004* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☒ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *7/20/04*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Priority

1. Acknowledgment is made of applicants' claim for foreign priority based on an application filed in Sweden on November 24, 2000. It is noted, however, that applicants have not filed a certified copy of the Swedish application as required by 35 U.S.C. 119(b).

Drawings

2. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the conically shaped metal tube (claim 10) must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as

per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Objections

3. Claim 10 is objected to because of the following informalities: in the 2nd line of the claim, "and" should be changed to "end" after "inlet". Appropriate correction is required.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to

consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. Claims 1-3, 5-7, and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over England et al. (US 5,016,460) in view of Darnfors (US 5,126,107).

England et al. disclose a finned metal tube that contains at least 30% nickel and 10% chromium, such that the finned metal tube body 24 (Figure 5) includes a plurality of smoothly curved valleys/recesses 28 and a plurality of smoothly curved peaks (fins 26) extending longitudinally along the length of the inner profile region of the tube, which would be conically tapered during manufacture with a conically tapered mandrel, with the outer surface of the tube also being smoothly curved (abstract; column 1, lines 53-68; column 2, lines 20-68; column 3, lines 1, 34-39, 62-68, and Tables; column 4, lines 1-13, 34-39, and 61; column 5, lines 12-29; and Figures 1, 2, and 5). The longitudinal internal fins 26 are selectively either straight or twisted, and the twisted (helical) fins are used in furnace applications where heat transfer needs to be increased (column 4, lines 62-68; and column 5, lines 1-9). England et al. do not disclose the specific elemental compositions of the metal alloy tube.

However, Darnfors discloses an iron/nickel/chromium alloy for use in high temperature applications, in which the alloy includes 0.01-0.08% C, 1.2-2.0% Si, trace to 2% Mn, 22-29% Cr, 32-38% Ni, 0.01-0.15% rare earth metals, 0.08-0.25% N, normal impurities (including unavoidable oxides of the above metals, including Cr, on the inner surface of the metal tube, thus forming a chromium oxide layer on inner regions of the

tube), and balance iron (also covering claims 5-7), with this composition being applicable to tubes in furnaces, combustion chambers, and fluidized beds, such that this composition is advantageous for improved resistance at high temperatures against carburizing and oxidizing, while providing good creep fracture resistance and resistance to attack from gaseous halides and metal oxides (abstract; column 1, lines 5-11 and 60-68; column 2, lines 1-68; column 3, lines 1-38 and 59-68; column 4, lines 1-11; and Figures 1 and 2).

It would have been obvious to one of ordinary skill in the art at the time the applicants' invention was made to modify the finned metal tube disclosed by England et al., by using the specified elemental composition of the metal alloy for tubes in high temperature applications, as taught by Darnfors, in order to improve resistance at high temperatures against carburizing and oxidizing, while providing good creep fracture resistance and resistance to attack from gaseous halides and metal oxides (Darnfors; abstract; column 1, lines 5-11 and 60-68; and column 2, lines 1-9).

7. Claims 1, 2, and 5-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Olsson (US 5,206,880) in view of Ernst (US 4,478,275), and further in view of Darnfors (US 5,126,107).

Olsson discloses furnace tubes for cracking hydrocarbons, in which the furnace tubes are finned metal tubes that contain 15-30% chromium and preferably coated with an aluminum oxide layer, such that the inner surface 3 of the finned metal tube body 1 includes a plurality of smoothly curved valleys/recesses and a plurality of smoothly

curved peaks (ribs 4) extending longitudinally along the length of the inner profile region of the tube, with the outer surface of the tube also being smoothly curved (abstract; column 1, lines 6-13; column 2, lines 1-56 and 63-68; column 3, lines 1-3 and 15-24; and Figures 1 and 2). Olsson does not disclose a chromium oxide layer and the specific elemental compositions of the metal alloy tube.

However, Ernst discloses an abrasion resistant heat pipe that includes two protective layers, including a layer that includes chromium oxide (obtained from oxidation of 20-30% chromium in the first (inner) layer, such that the chromium oxide in the first layer is advantageous for protection of the heat pipe because it will not decompose in the high temperature environment of a combustion chamber (column 2, lines 5-10 and 23-27; and column 3, lines 44-68).

It would have been obvious to one of ordinary skill in the art at the time the applicants' invention was made to modify the furnace tubes for cracking hydrocarbons, as disclosed by Olsson, by using a protective layer that includes chromium oxide, as taught by Ernst, in order to protect the heat pipe so that it will not decompose in the high temperature environment of a combustion chamber (Ernst; column 2, lines 23-27; and column 3, lines 59-64).

Olsson (in view of Ernst) disclose and/or suggest the elements of the claims above, with the exception of the specific elemental compositions of the metal alloy tube.

However, Darnfors discloses an iron/nickel/chromium alloy for use in high temperature applications, in which the alloy includes 0.01-0.08% C, 1.2-2.0% Si, trace to 2% Mn, 22-29% Cr, 32-38% Ni, 0.01-0.15% rare earth metals, 0.08-0.25% N, normal

impurities (including unavoidable oxides of the above metals, including Cr, on the inner surface of the metal tube, thus forming a chromium oxide layer on inner regions of the tube), and balance iron (also covering claims 5-7), with this composition being applicable to tubes in furnaces, combustion chambers, and fluidized beds, such that this composition is advantageous for improved resistance at high temperatures against carburizing and oxidizing, while providing good creep fracture resistance and resistance to attack from gaseous halides and metal oxides (abstract; column 1, lines 5-11 and 60-68; column 2, lines 1-68; column 3, lines 1-38 and 59-68; column 4, lines 1-11; and Figures 1 and 2).

It would have been obvious to one of ordinary skill in the art at the time the applicants' invention was made to modify the furnace tubes for cracking hydrocarbons, as disclosed by Olsson, by using a protective layer that includes chromium oxide, as taught by Ernst, in order to protect the heat pipe so that it will not decompose in the high temperature environment of a combustion chamber, and by further using the specific iron/nickel/chromium alloy for use in high temperature applications, as disclosed by Darnfors, in order to improve resistance at high temperatures against carburizing and oxidizing, while providing good creep fracture resistance and resistance to attack from gaseous halides and metal oxides (Darnfors; abstract; column 1, lines 5-11 and 60-68; and column 2, lines 1-9).

Response to Arguments

8. The examiner acknowledges the applicants' amendment with corrected and new formal drawings, as well as a second Information Disclosure Statement, all of which were received by the USPTO on July 20, 2004. The Information Disclosure Statement has been considered, initialed, and enclosed with this Office Action, and its reference (Olsson) further being used in a new rejection in paragraph 7 above. The amendment overcomes prior objections to the abstract and specification, as well as the prior 35 USC 112, 2nd paragraph rejections. However, the drawings only overcome the prior objections with the exception of the new objection necessitated by the addition of new claim 10 (conically shaped metal tube not shown in new drawings). In addition, the applicants are referred to paragraph 1, regarding the lack of priority papers in the application file. Claims 8 and 9 are withdrawn from consideration as being treated as an election without traverse (no arguments provided in applicants' reply on April 5, 2004 to the election/restriction). The applicants have cancelled claims 4, while adding new claim 10. Claims 1-3, 5-7, and 10 are currently under consideration in the application.

9. Applicants' arguments with respect to claims 1-3, 5-7, and 10 have been considered but are moot in view of the new ground(s) of rejection.

With regard to the applicants' remarks on pages 13-15 of the amendment dated July 20, 2004, the applicants are referred to newly cited documents in PTO-892 that disclose and/or suggest that a formed chromium oxide layer that results from oxidation of chromium would occur as an oxide film under normal conditions, and is viewed as an

inherent occurrence on the surface of chromium. Chromium oxide as a protective layer is also discussed in the PTO-892 references that include Heyse et al. (column 7, lines 28-64) and Wahlert et al. (column 1, lines 59-62; and column 4, lines 60-64).

Conclusion

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The Heyse et al. and Wahlert et al. references are also cited in PTO-892.

11. Applicants' submission of an information disclosure statement under 37 CFR 1.97(c) with the fee set forth in 37 CFR 1.17(p) on July 20, 2004 prompted the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 609(B)(2)(i). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dr. Kevin P. Kerns whose telephone number is (571) 272-1178. The examiner can normally be reached on Monday-Friday from 8:00am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Dunn can be reached on (571) 272-1171. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Kevin P. Kerns
Examiner
Art Unit 1725

Kiley Stoner AU 1725
Kiley Stoner 8/2/04

KPK
kpk
July 30, 2004